

# Brisbane Building Efficiency Program

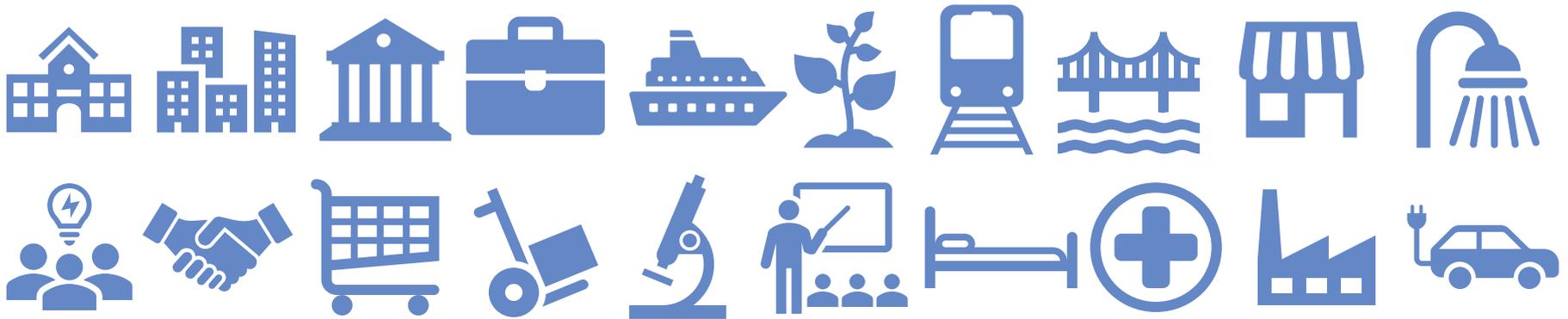
Adrienne Etherton  
Sustainability Management Analyst  
City of Brisbane

January 15, 2020

# Road Map

---

- ★ Concept and context
- ★ Brisbane's setting
- ★ Ordinance details
- ★ Impacts and next steps



# How Energy Efficiency Benefits CA

## DECREASES POLLUTION

- ▶ Avoided **30** LARGE POWER PLANTS since 1970s, 11 more expected to be avoided over the next decade 
- ▶ Cuts MILLIONS OF TONS OF POLLUTANTS contributing to asthma, other ills

## CUTS ENERGY WASTE

- ▶ Saved enough electricity since 2003 to power **MORE THAN HALF OF CALIFORNIA'S HOMES FOR ONE YEAR** 
- ▶ Met about 1/5 of the state's electricity need in 2013
- ▶ Helped keep per capita electricity use flat vs. 50% increase in rest of U.S. (since 1970s)

## SAVES CALIFORNIANS MONEY

- ▶ Efficiency programs saved \$12 billion after costs (2003-2013)
- ▶ Research projects yielded \$446 for every \$1 invested
- ▶ Newest building codes to save \$6,000 per house

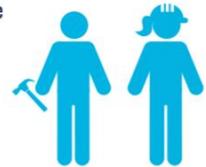
**\$75 billion**

(since 1970s)

- ▶ Codes and standards saved a total of

## CREATES JOBS, SPURS ECONOMY

- ▶ Efficiency jobs grew 15% compared to 2% economy-wide (2002-2012)
- ▶ California produces 2x benefit for every unit of electricity compared to the rest of U.S.



## HELPS LOW-INCOME CUSTOMERS

- ▶ Low-income efficiency programs served almost **3 MILLION HOUSEHOLDS** (since 2003)
- ▶ Saved enough electricity to power **90,000 HOMES** and enough natural gas for nearly **80,000 HOMES** for 1 year

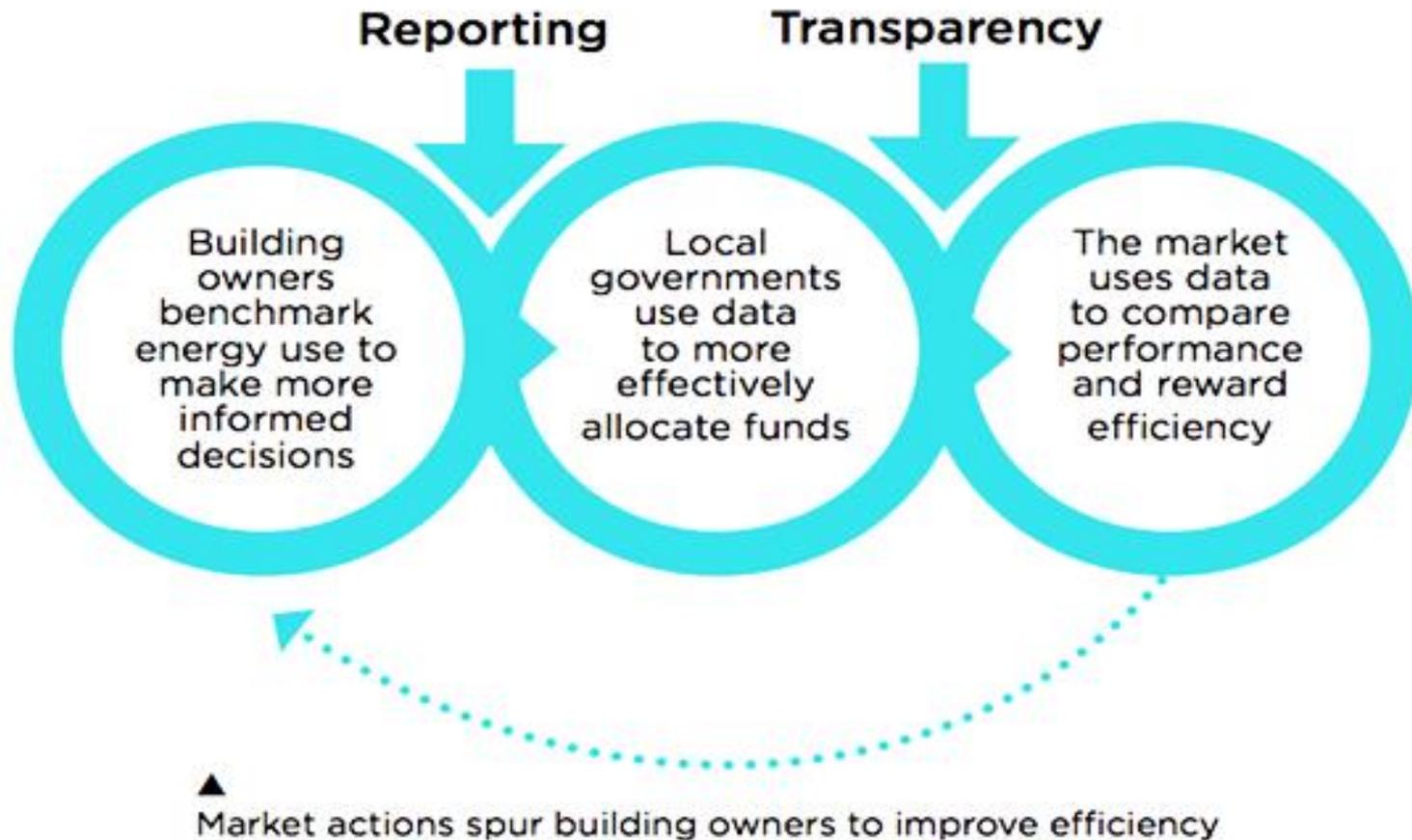
## HELPS MEET CLIMATE GOALS

- ▶ Slashed **30 MILLION** metric tons of CO<sub>2</sub> pollution, equal to annual emissions of 6 MILLION cars (since 2003) 
- ▶ Cuts one of the largest sources of California's greenhouse gas emissions

\*NRDC. CA Energy Efficiency Opportunity Report



# Market Transformation



# Key Terms

---

## ★ Benchmarking:

- Annual reporting of energy and water use
- Allows comparisons with other like buildings, or with the same building over time or under different scenarios

## ★ Auditing:

- Assessment of a building's energy and water systems to identify opportunities to save energy and money
- Produces a list of energy conservation measures (ECMs) with associated costs and savings

## ★ Retro-commissioning

- Review of existing building systems to ensure they are operating the way they were designed to
- AKA re-tuning



# ENERGY STAR Portfolio Manager

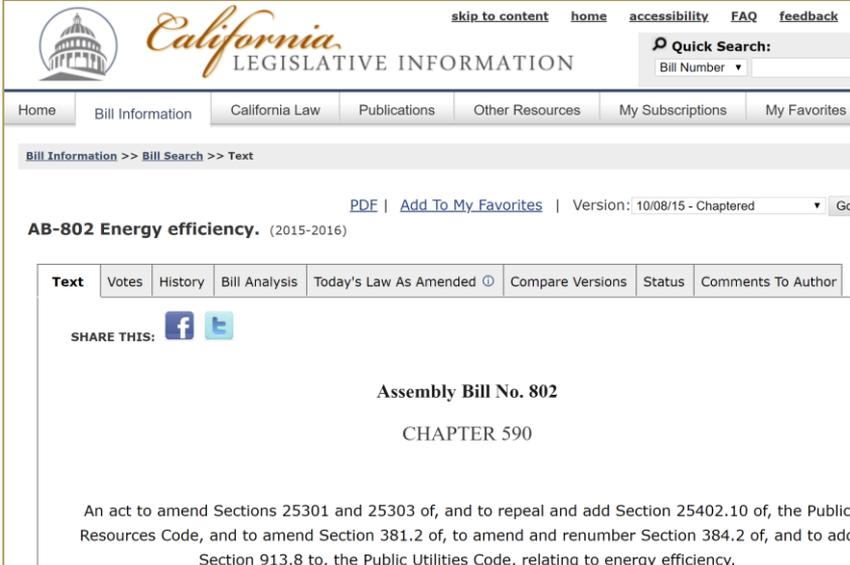
---

- ★ No cost, interactive energy management tool
- ★ US Department of Energy + Environmental Protection Agency
- ★ Benchmarked in Portfolio Manager
  - 21+ billion sf
  - 185,000 buildings
  - 25% of total building market



# California Assembly Bill 802 - Building Energy Benchmarking Program

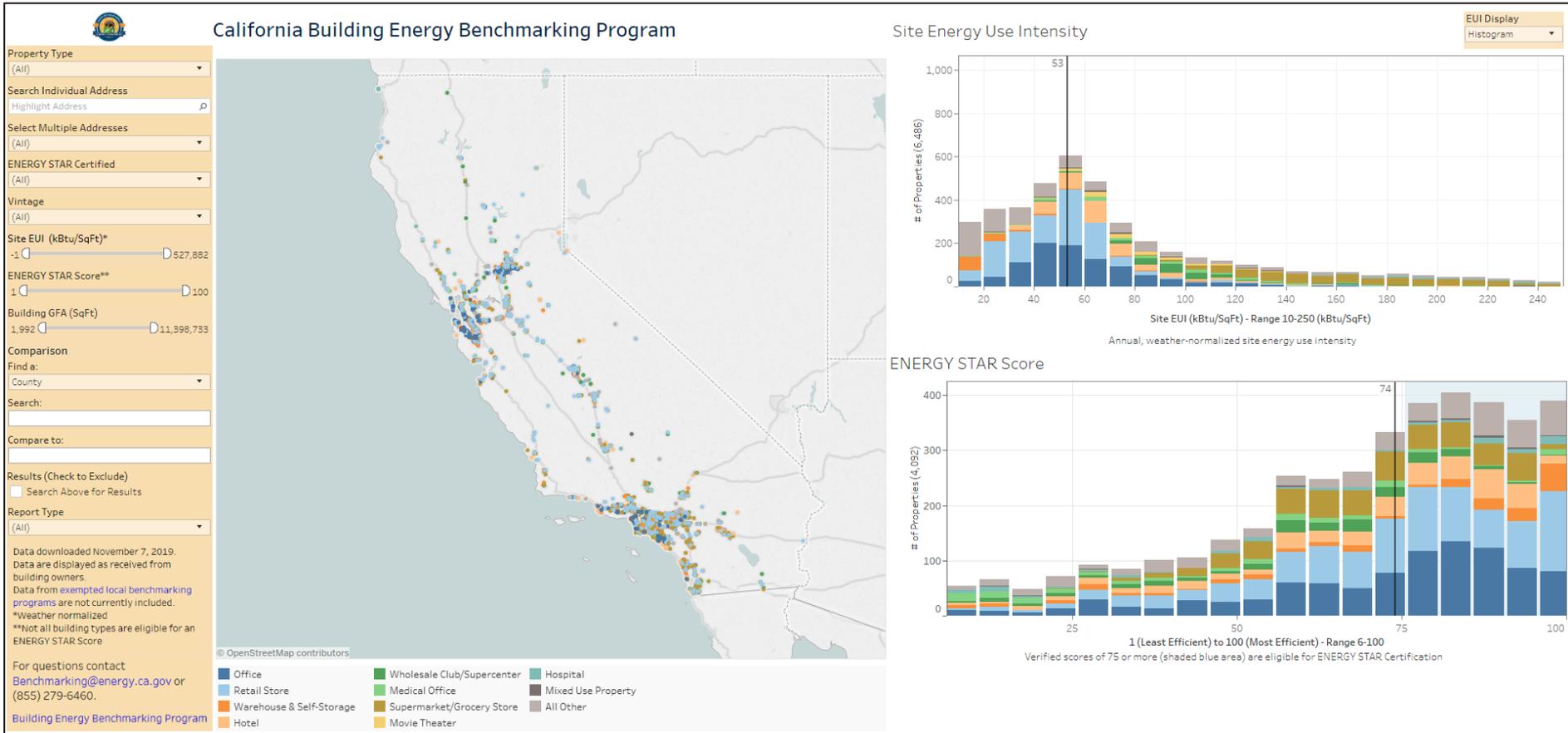
- ★ Allows building owners (or representatives) to request building-level energy use data from utilities
- ★ Requires building owners to benchmark and report their buildings
  - Commercial buildings 50,000 square feet or larger
  - Tool used: ENERGY STAR Portfolio Manager
  - Submitted to: California Energy Commission



The screenshot shows the California Legislative Information website for Assembly Bill 802. The page title is "AB-802 Energy efficiency. (2015-2016)". The page content includes the text of the bill, which is an act to amend Sections 25301 and 25303 of the Public Resources Code, and to repeal and add Section 25402.10 of the Public Resources Code, and to amend Section 381.2 of, to amend and renumber Section 384.2 of, and to add Section 913.8 to, the Public Utilities Code, relating to energy efficiency. The page also features a "SHARE THIS:" section with Facebook and Twitter icons, and a "Text" tab selected in the navigation menu.

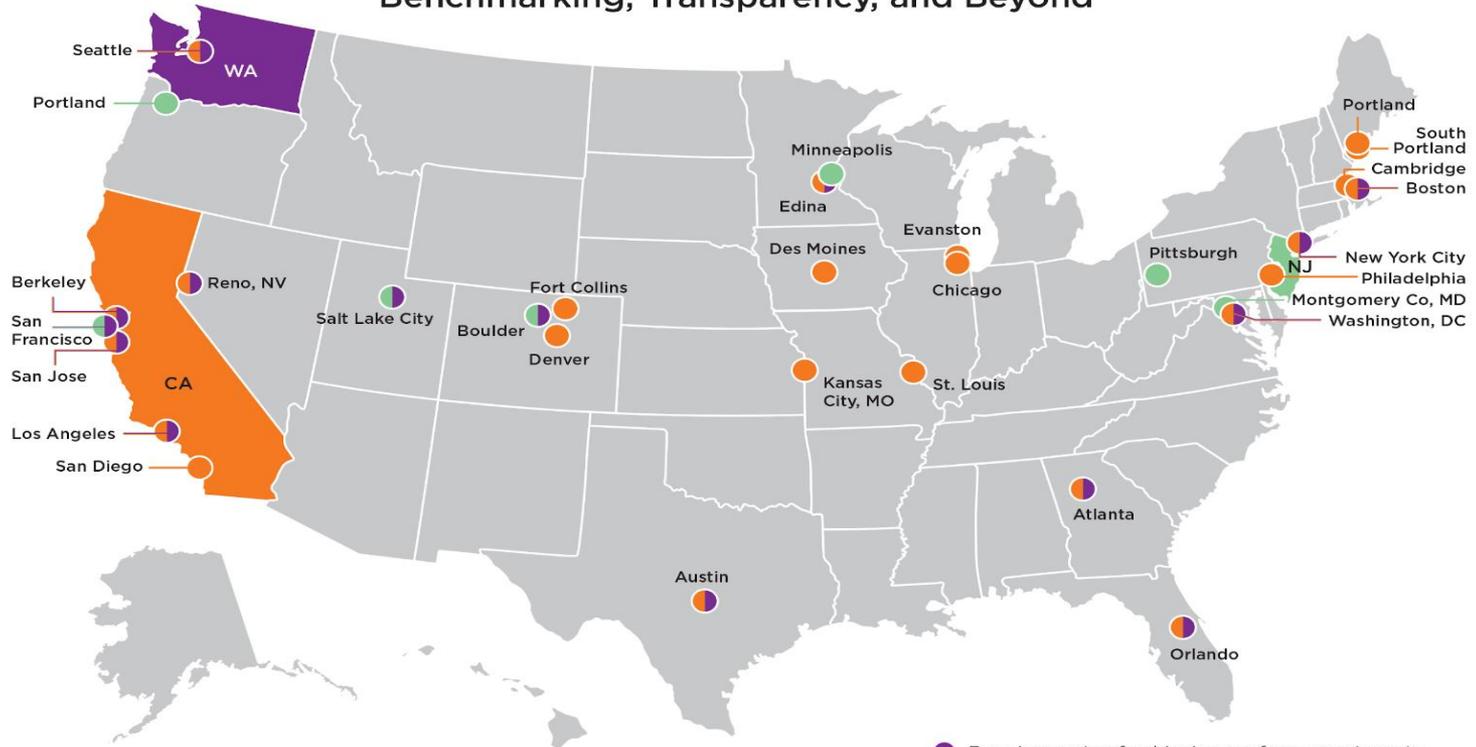


# California Assembly Bill 802 - Building Energy Benchmarking Program



# Who's already done it?

## U.S. City, County, and State Policies for Existing Buildings: Benchmarking, Transparency, and Beyond



- Requirements of achieving performance targets or completing additional actions
- Benchmarking policy for public, commercial, and multifamily buildings adopted
- Benchmarking policy for public and commercial buildings adopted



© Copyright 2019 Institute for Market Transformation. Updated 6/2019



# Brisbane's Setting

**RICAPS**  
Regional Integrated Climate Action Planning System

**City of Brisbane**  
Climate Action Plan

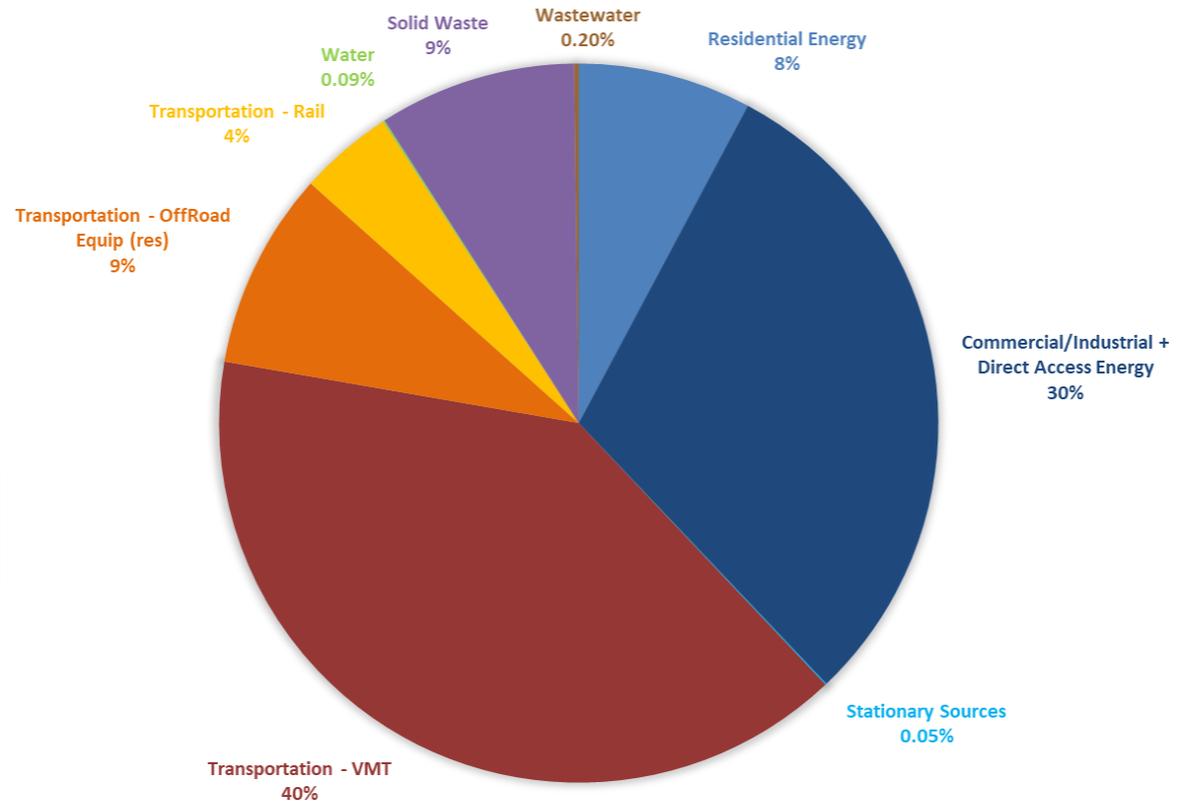


Adopted September 17, 2015  
Prepared in collaboration with City/County Association of Governments of San Mateo County

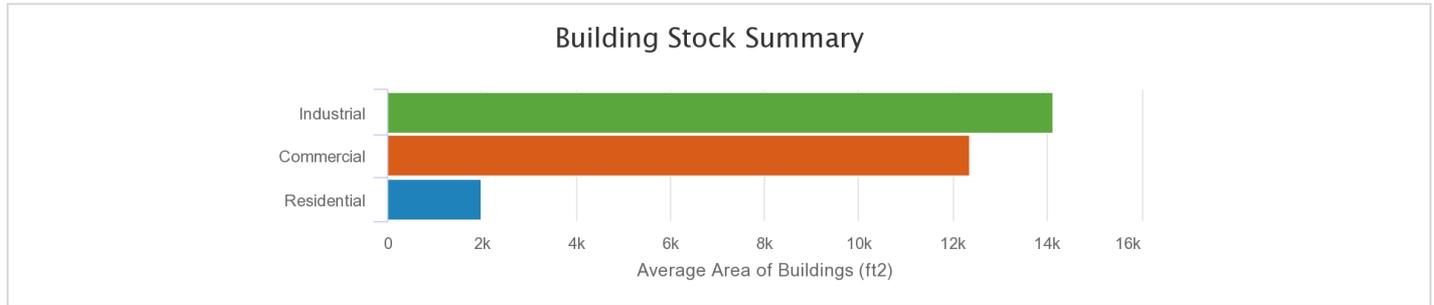
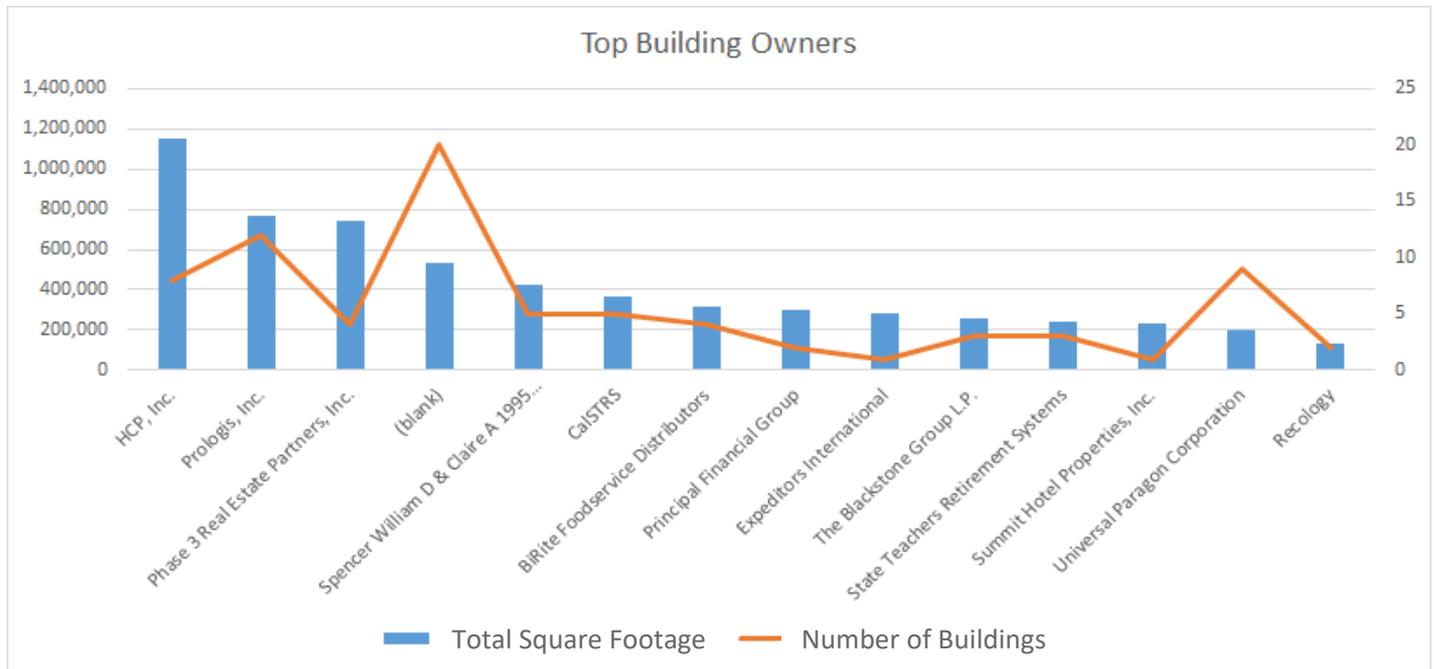


**BAY AREA**  
**AIR QUALITY**  
MANAGEMENT  
DISTRICT

**Brisbane 2015 Community GHG Inventory**



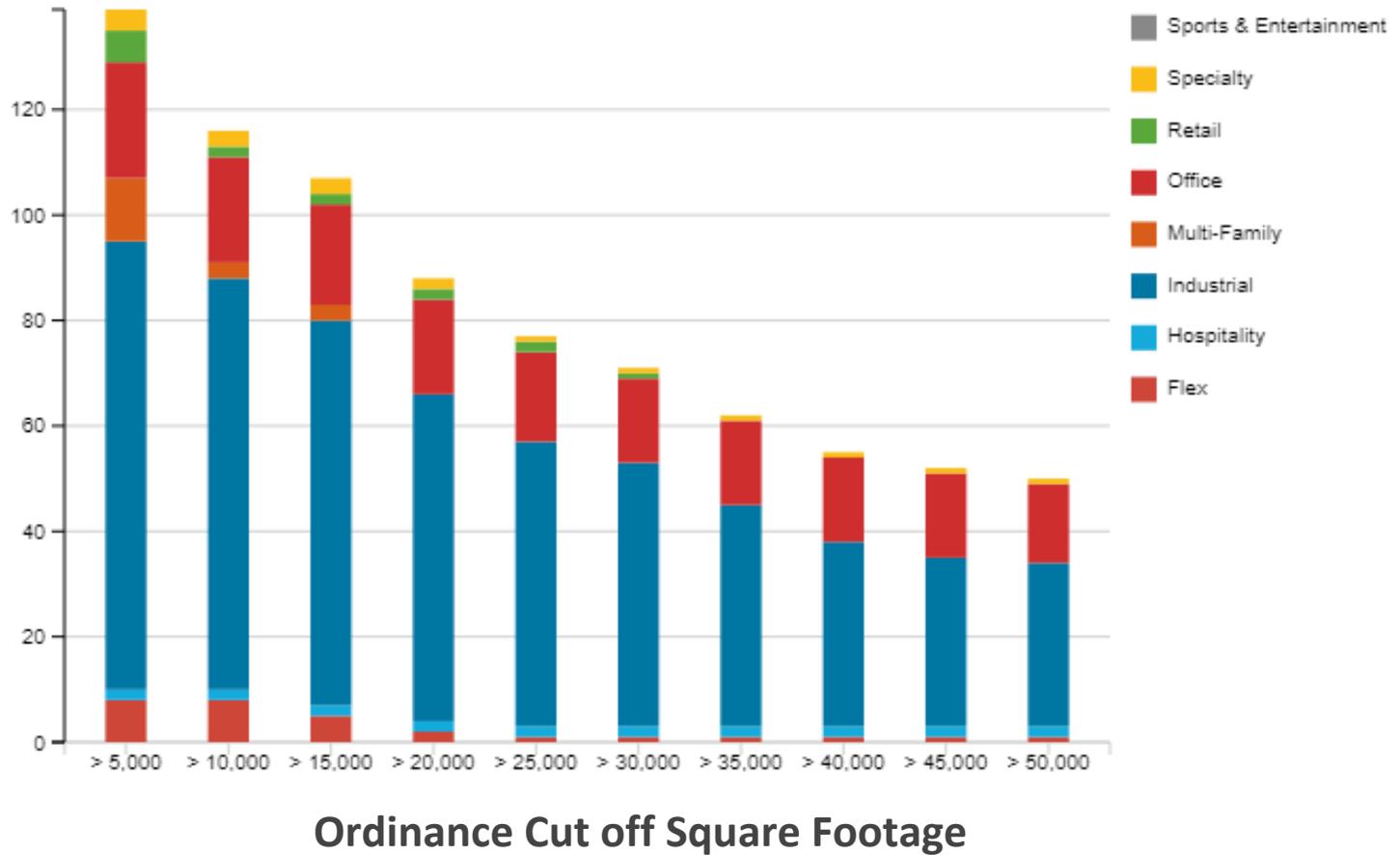
Total Building Square Footage



# Brisbane Building Owners & Average Building Size



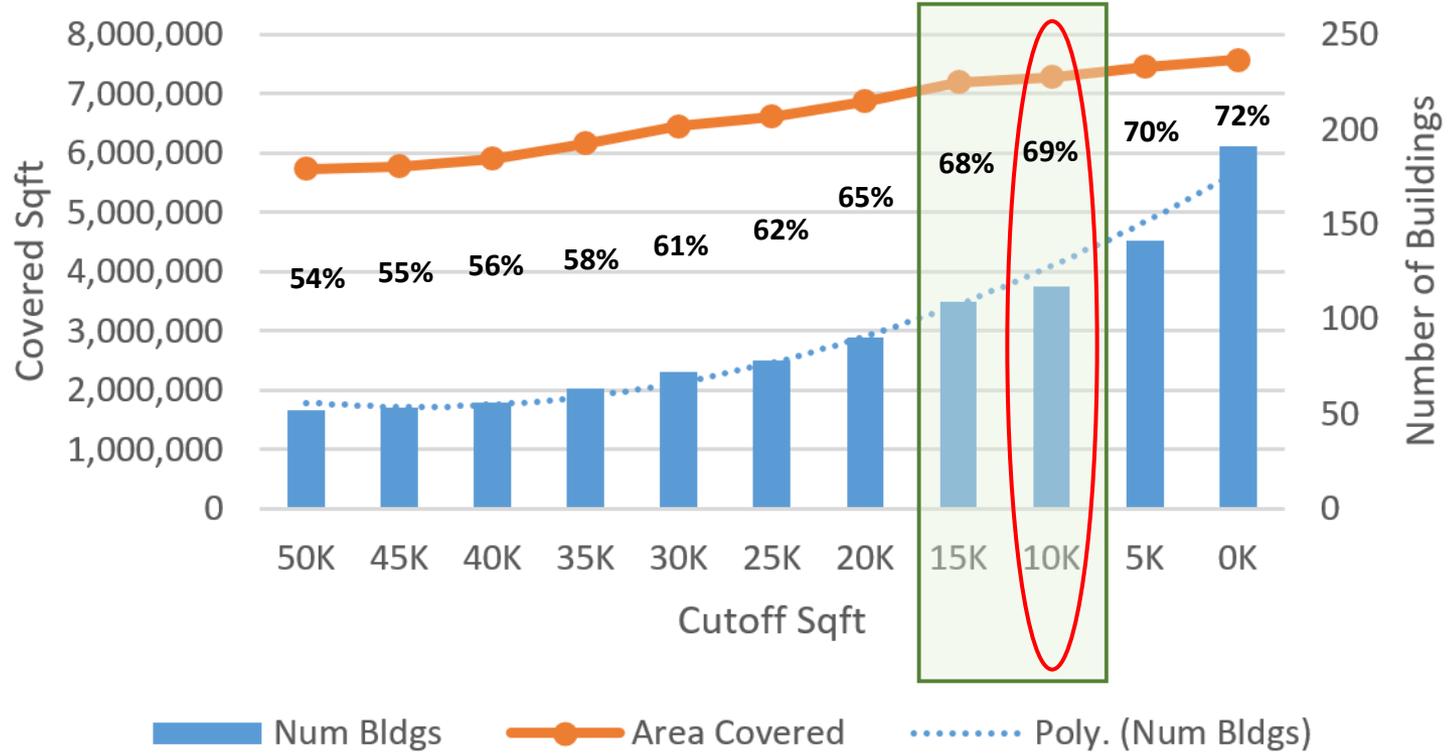
Total Number of Buildings



# What type of buildings are in Brisbane?



## Number of Buildings vs Covered Sqft



What size of buildings should we look at?



# Covered Buildings

---

- ★ Commercial, Industrial and Multi-Family Residential buildings 10,000 square feet or larger
- ★ Refer to state definition of “Covered Building”:

Regulations Implementing Building Energy Use Data Access, Benchmarking, and Public Disclosure Procedures of Assembly Bill 802 (Williams, 2015)

California Code of Regulations

Title 20. Public Utilities and Energy

Division 2. State Energy Resources Conservation and Development Commission

Chapter 4. Energy Conservation

Article 9. Building Energy Use Data Access, Benchmarking, and Public Disclosure

...

(c) Covered Building: Any structure used or intended to support or shelter any use or occupancy, other than a condominium project as described in section 4125 or 6542 of the California Civil Code, that received Energy from a Utility during the period for which Energy use data is requested, and has (1) no residential Utility Accounts, or (2) five or more Active Utility Accounts of any one Energy type, at least one of which is residential. Two or more Covered Buildings on the same parcel, campus, or site that are served by one common Energy meter without submetering, such that their Energy use cannot be tracked individually, shall be considered one Covered Building.



# Stakeholder Engagement Efforts

- ★ 2 Workshops
- ★ 2 Webinars
- ★ Online: website, email, surveys
- ★ Staff 1-on-1 meetings with:

- Prologis
- UPC
- Bi-Rite
- FW Spencer
- Phase 3

- ★ Study Session with Economic Development Subcommittee and OSEC CAP Subcommittee

- Follow-up meeting with each subcommittee separately

- ★ Planning Commission

- ★ Open Space and Ecology Committee



# Innovating to address concerns

---

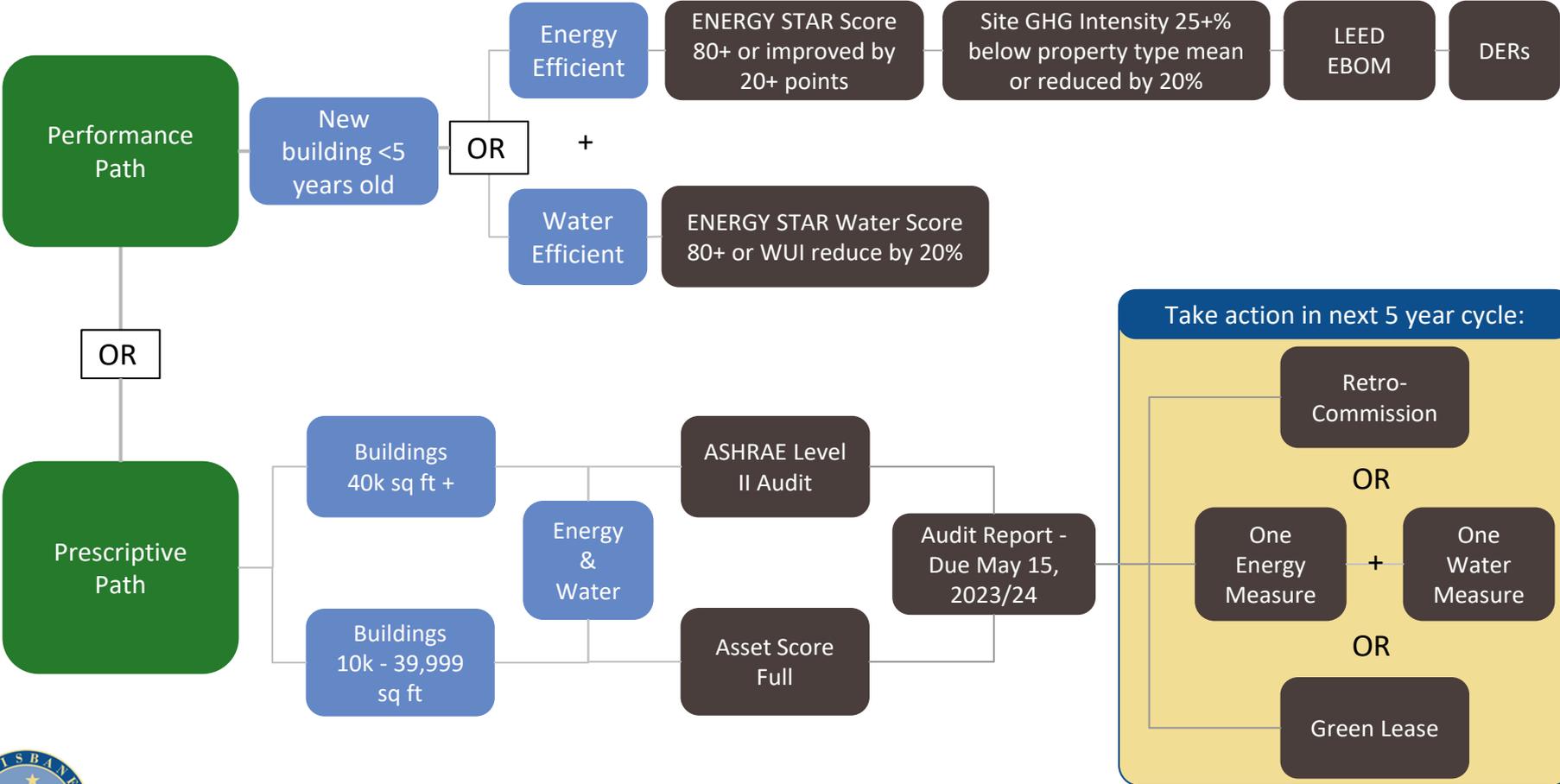
- ★ Industrial buildings included
- ★ Extends requirements to tenants in some cases
  - Washington D.C. example
  - Eases concerns of owners with rental agreements that provide control to lessees
  - Provides both tenants and owners recourse through exemptions, extensions, hardships and appeals
- ★ Green Lease compliance option
- ★ Report on current or planned distributed energy resources



# Compliance Pathways

Annual Benchmarking beginning 2021 - 10,000 sq ft or more

Beyond Benchmarking - every 5 years beginning: 2023 for commercial, 2024 industrial + residential



# Compliance Schedule

---

- ★ By May 15, 2020 (& annually thereafter)
  - Benchmarking of all city-owned buildings over 2000 sqft
- ★ *City option for voluntary early compliance pilot*
- ★ May 15, 2021 (& annually thereafter)
  - Benchmarking of all private buildings over 10,000 sqft
- ★ May 15, 2023 (& every 5 years thereafter)
  - Beyond Benchmarking report for Commercial buildings over 10,000 sqft
- ★ May 15, 2024 (& every 5 years thereafter)
  - Beyond Benchmarking report for Industrial & Residential buildings over 10,000 sqft



# Average Audit Savings and Costs

## ★ Asset Score

- PNNL [technical report](#) states data collection takes 6 - 20 hours
- ~ \$600 - \$2,000 at \$100/hr
- Asset Score [reference](#) report

## ★ Savings

- Utility costs in U.S. office buildings average \$2.20/sq. ft.
- 20% reduction in energy use = savings of \$0.44/sq. ft. (DOE EERE 2011c)

Building Size	ASHRAE Level 2 Audit Cost Estimate	RCx Report Cost Estimate*
40,000 sq. ft.	\$6,000	\$12,000
100,000 sq. ft.	\$15,000	\$30,000
*RCx typically has low cost measures		

	\$ / Sq. Ft.
Audit Cost	\$0.10 - 0.15
RCx Cost	\$0.20 - 0.30
Total Cost	\$0.30 - 0.45
Estimated Utility Savings	\$0.44
Costs recouped in ~1 year; savings continue	



# Expected Impacts

## ★ How many buildings are affected?

- Benchmarking: 109 / 6.6M sqft
- ASHRAE Level 2 Audits: 48 / 5.3M sqft
- Asset Score - Full: 61 / 1.3M sqft

## ★ What are the expected GHG Impacts?

- ~2700 MTCO<sub>2</sub>e reduction within 5 years of ordinance effective date



# What comes next?

## BAAQMD Grant Phase 2: Implementation

- ★ RFP & contract for support
- ★ Develop administrative systems (database, forms, outreach materials)
- ★ Develop web portal with details on ordinance, how to comply + resources:
  - Auditing & retro-commissioning
  - Existing rebates & incentives
  - Available financing
  - Distributed energy resources
  - Energy sources (fuel-switching, PCE ECO-100)
  - Green Leases
  - ROI & other benefits of improvements
  - Case studies & testimonials
- ★ Outreach, education and training
  - Webinars, workshops & on-demand web trainings
  - Small business compliance support
- ★ Toolkit for other jurisdictions to replicate the program
- ★ Benchmark city buildings + run compliance pilot
- ★ Determine ongoing (post-grant) resource needs



# Questions?

---

B-BEP!



[brisbaneca.org/building-efficiency-program](http://brisbaneca.org/building-efficiency-program)



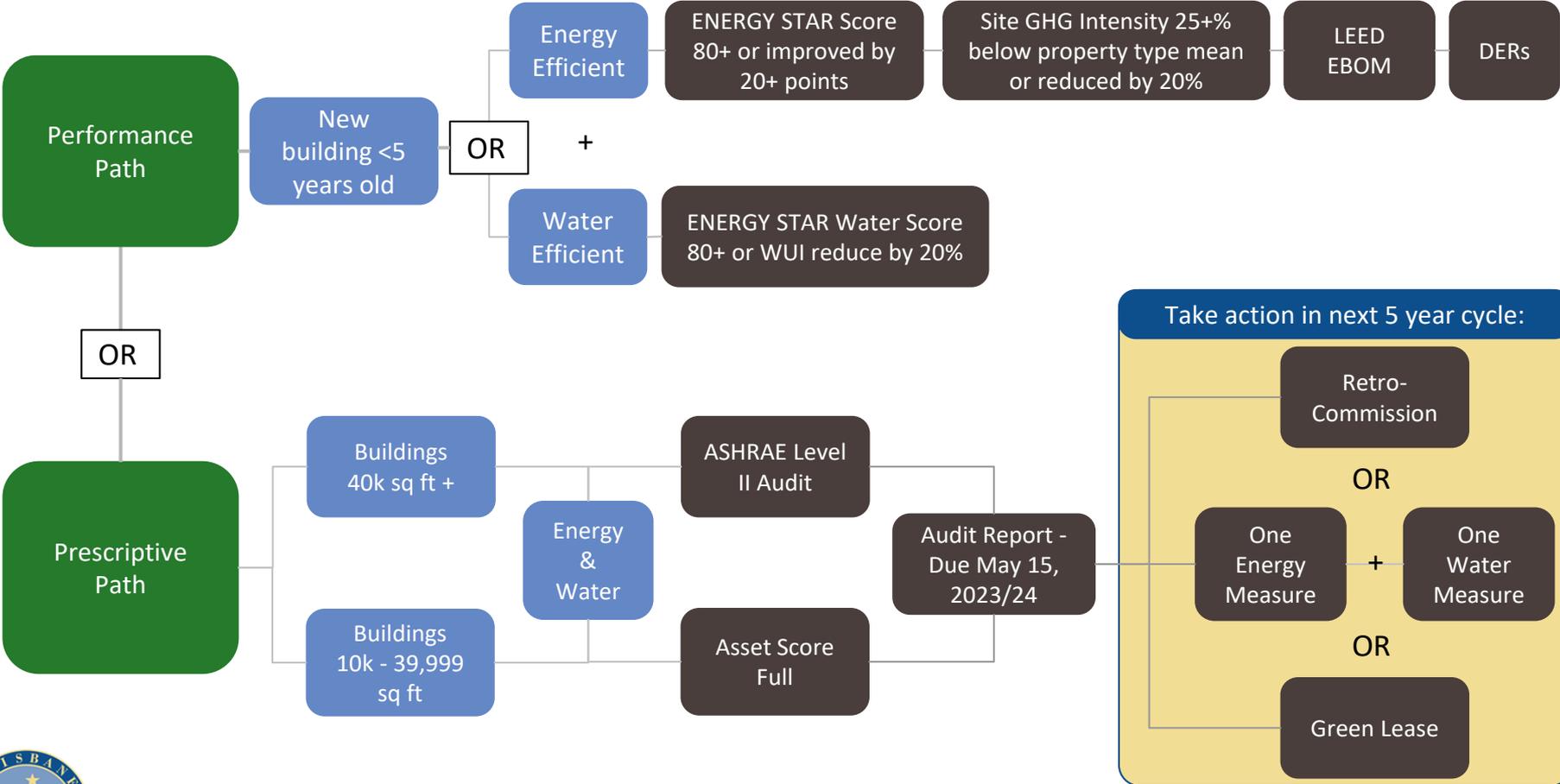
# SUPPLEMENTAL SLIDES



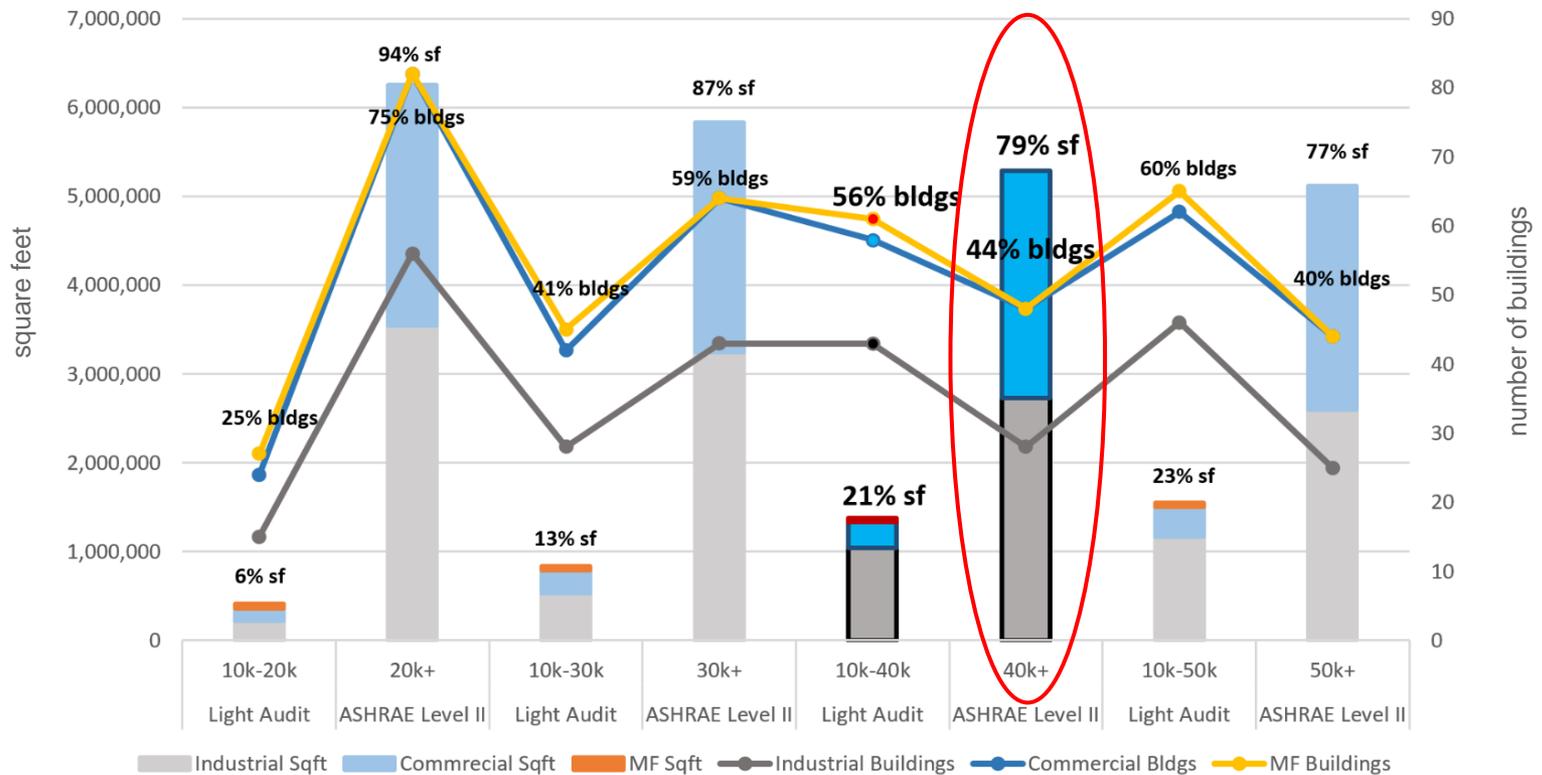
# Compliance Pathways

Annual Benchmarking beginning 2021 - 10,000 sq ft or more

Beyond Benchmarking - every 5 years beginning: 2023 for commercial, 2024 industrial + residential



# Beyond Benchmarking Cutoff Scenarios



## Why 40,000 square feet?

Minimize number of buildings affected, maximize square footage captured.

# Exemptions

---

- ★ No Certificate of Occupancy for half or more of the year
- ★ Building vacant for half or more of the year
  - Beyond Benchmarking, 50+% vacant = Asset Score Full
- ★ The building did not receive energy or water services for half or more of the year
  - Beyond Benchmarking = Asset Score Full
- ★ A demolition permit for the entire building has been issued, or a schedule for demolition can be reasonably documented
- ★ Beyond Benchmarking adds:
  - Intended for sale with real estate appraisal within 1 year of reporting deadline
  - Recently constructed and received Certificate of Occupancy within last 5 years; report next cycle



# Penalties, Fees, and Appeals

---

## ★ Penalties:

- The violation of any provisions of this Chapter shall constitute an infraction punishable by the fines, penalties and enforcement provisions set forth in Chapters 1.14, 1.16 and 1.18 of this Code

## ★ Fees:

- None currently set
- May be imposed by Council Resolution

## ★ Appeals:

- To the PW Director within 15 days
- To the City Manager within 10 days



# Energy Efficiency Improvement Options

---

- ★ Lighting meeting current CA Building Code
- ★ Replace all gas water heaters with electric heat pump or tankless water heaters
- ★ Replace all refrigerators with Energy Star models
- ★ Replace all gas stoves with electric induction
- ★ Install smart thermostats
- ★ Install solar thermal heating/cooling
- ★ Install a cool roof
- ★ Building envelope measures such as insulation, air sealing and window upgrades
- ★ Participate in approved utility retrofit program
- ★ Upon request – other measures identified by audit/RCx



# DER Improvement Options

---

- ★ Solar Photovoltaic
- ★ Stationary Electric Storage
- ★ Grid-interactive Efficient Building
- ★ Electric Vehicle (EV) Charging Infrastructure
- ★ Decarbonized Building (produces onsite or procures carbon-free renewable energy in an amount sufficient to offset the annual carbon emissions associate with operations)



# Water Efficiency Improvement Options

---

- ★ All plumbing systems meeting current CA Building Code
- ★ Outdoor landscaping and irrigation in compliance with current Brisbane Water Conservation in Landscaping code
- ★ Install greywater system following CA code
- ★ Insulate all hot water pipes in accessible locations
- ★ Participate in approved water utility retrofit program
- ★ Upon request – other measures identified by audit/RCx

